

forming a pupil in a space between a plurality of lenses.

162. (NEW) An imaging method comprising:

forming an intermediate image of an object with a first refractive optical system;

forming an image of the intermediate image with a refractive-reflective optical system;

and

guiding a light from the image of the intermediate image with a second refractive optical system,

wherein the method does not turn an optical path of the first and the second refractive optical systems.

163. (NEW) An imaging method comprising:

a first step of forming an intermediate image of an object with a first refractive optical system;

a second step of forming an image of the intermediate image with a refractive-reflective optical system;

a third step of guiding a light from the image of the intermediate image with a second refractive optical system; and

turning an optical path at least one of between the first step and the second step and between the second step and the third step.

REMARKS

INTRODUCTION:

In accordance with the foregoing, claims 1-43 have been cancelled without prejudice or disclaimer, claims 44-163 have been added, and the specification has been amended to refer to the parent application and to amend the specification consistent with the amendments made in the parent application. All amendments and new claims are made relative to the issue patent in accordance with 37 CFR 1.173. No new matter is being presented, and approval and entry of the foregoing amendments and new claims is respectfully requested.

Claims 44-163 are pending and under consideration.

PATENTABILITY OF NEW CLAIMS:

Claims 44-163 are supported in the specification at least in the embodiments at FIGs. 5, 8, 10, 17, and 23 and described in corresponding sections of the specification at col. 11, line 37

to col. 12, line 61 and col. 13, line 62 to col. 14, line 62 to col. 14, line 62, which show refractive and refractive-reflective optical systems and/or refractive and refractive-reflective lens groups in which the light beams used for imaging are not eclipsed/obscured by elements such as the partial mirror 13.

Claim 44 is deemed patentable due at least to the prior art not disclosing or suggesting at least that "said first refractive optical sub-system forms an intermediate image of an object in an optical path between said first refractive optical sub-system and said refractive-reflective optical sub-system," "said refractive-reflective optical sub-system forms an image of said intermediate image in an optical path between said refractive-reflective optical sub system and said second refractive optical sub-system," and "the turning mirror is disposed near the intermediate image and/or the image of the intermediate image" as recited in claim 44.

Claims 61, 115, 121, 133, 140, 148, 149, 155, 156, and 163 are deemed patentable over the prior art for at least similar reasons as why claim 44 is patentable.

Claim 70 is deemed patentable due at least to the prior art not disclosing or suggesting at least that "said first refractive optical sub-system forms an intermediate image of an object in an optical path between said first refractive optical sub-system and said refractive-reflective optical sub-system," "said refractive-reflective optical sub-system forms an image of said intermediate image in an optical path between said refractive-reflective optical sub system and said second refractive optical sub-system," "the first and the second refractive optical sub-system include a plurality of refractive elements," and "the pupil is disposed in a space between the plurality of refractive elements" as recited in claim 70.

Claims 103, 128, 153, and 161 are deemed patentable over the prior art due at least to reasons similar to why claim 70 is patentable.

Claim 78 is deemed patentable due at least to the prior art not disclosing or suggesting at least that "said first refractive optical sub-system forms an intermediate image of an object in an optical path between said first refractive optical sub-system and said refractive-reflective optical sub-system," "said refractive-reflective optical sub-system forms an image of said intermediate image in an optical path between said refractive-reflective optical sub system and said second refractive optical sub-system," "the first and the second refractive optical sub-system include a plurality of refractive elements," and "the catadioptric optical system images through unobscuration of an imaging light beam" as recited in claim 78.

Claims 150 and 158 are deemed patentable over the prior art due at least to reasons similar to why claim 78 is patentable.

Claim 86 is deemed patentable due at least to the prior art not disclosing or suggesting

at least that "said first refractive optical sub-system forms an intermediate image of an object in an optical path between said first refractive optical sub-system and said refractive-reflective optical sub-system," "said refractive-reflective optical sub-system forms an image of said intermediate image in an optical path between said refractive-reflective optical sub system and said second refractive optical sub-system," "the first and the second refractive optical sub-system include a plurality of refractive elements," "the first refractive optical sub-system includes a field lens which is disposed near the intermediate image," and "the second refractive optical sub-system includes a field lens which is disposed near the image of the intermediate image" as recited in claim 86.

Claims 151 and 159 are deemed patentable over the prior art due at least to reasons similar to why claim 86 is patentable.

Claim 97 is deemed patentable due at least to the prior art not disclosing or suggesting at least that "first refractive optical sub-system forms an intermediate image of an object in an optical path between said first refractive optical sub-system and said refractive-reflective optical sub-system," "said refractive-reflective optical sub-system forms an image of said intermediate image in an optical path between said refractive-reflective optical sub system and said second refractive optical sub-system," and "the catadioptric optical system forms a final image of the object at a finite distance onto an image surface at the finite distance" as recited in claim 97.

Claims 152 and 160 are deemed patentable over the prior art due at least to reasons similar to why claim 97 is patentable.

Claim 154 is deemed patentable due at least to the prior art not disclosing or suggesting at least that "a first refractive optical means for forming an intermediate image of an object," "refractive-reflective optical means for forming an image of the intermediate image," and "second refractive optical means for guiding a light from the intermediate image," "wherein a turning mirror is not in an optical path of the first refractive optical sub-system and the second refractive optical sub-system" as recited in claim 154.

Claims 109 and 162 is deemed patentable over the prior art due at least to reasons similar to why claim 154 is patentable.

Claims 45-60, 62-69, 71-77, 79-85, 87-96, 98-102, 104-108, 110-114, 116-120, 122-127, 129-132, 134-139, 141-147, and 157 are deemed patentable due at least to their depending from corresponding claims 44, 61, 70, 78, 86, 97, 103, 109, 115, 121, 128, 133, 140, and 156.

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all pending claims patentably

distinguish over the prior art, and the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any additional fees associated with the filing of this Preliminary Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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